

Potential Sources of Environmental Data



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Survey of Some Environmental Datasets



- ⌘ Overview of Existing Datasets (with information on carcinogens)
 - ☑ Air
 - ☑ Other
- ⌘ National-scale Air Toxics Assessment (NATA)

Air Datasets

Database	Pollutants	Geographic Coverage	Temporal Coverage	Data Type
National-scale Air Toxics Assessment (NATA)	33 Air Toxics (mostly carcinogens)	National, with county and census tract level results	1990 (CEP) 1996 (available) 1999 (coming)	Modeled Air Concentrations; Estimated Exposures
National Emission Inventory (NEI)	188 Hazardous Air Pollutants	National, with much variability in quality among states & source categories	1996 & 1999 (available) 2002 (coming in 2005)	Air releases from point, area and mobile sources
Toxic Release Inventory (TRI)	~ 600 chemicals	National	Annual since 1989	Releases to air, water, land and shipped offsite
Urban Air Toxics Monitoring Program (UATMP)	70 Air Toxics	~ 42 sites mostly in urban areas	Some go back to 1989	Ambient air monitoring data

Other Datasets

Database	Pollutants	Geographic Coverage	Temporal Coverage	Data Type
Ground Water Classification Exception Areas (CEA)	Yes/No for 21 Chemicals and categories	~1500 areas in New Jersey	Begins 1997	Location polygon
Community Drinking Water Systems	9 Volatile Organic Compounds (VOCs)	4,249 public water systems in New Jersey	Begins 1978	Delivered drinking water quality
Private Well Testing	Lead, VOCs, radium	New Jersey	Began compiling Sept. 2002	Ambient ground water quality
Pesticides	Chlorophenoxy & other pesticides	New Jersey	Survey every 3 years	Quantity of pesticides applied

National-scale Air Toxics Assessment (NATA)



- ⌘ Modeling analysis of 33 toxic air pollutants
- ⌘ Wide variety of sources: Point, area, mobile
- ⌘ Census tract level predictions

www.epa.gov/ttn/atw/nata

Purpose of NATA



- ⌘ Identify air toxics of greatest potential concern, in terms of population risk
- ⌘ Characterize contributions of different types of sources of air toxics
- ⌘ Establish baseline for tracking trends in emissions and concentrations
- ⌘ Establish baseline for assessing progress in meeting risk reduction goals

Components of NATA: National Toxics Inventory (NTI)



- ⌘ Emissions inventory for 1996
- ⌘ Compiled by USEPA
- ⌘ Sent to states for review and/or revision
- ⌘ All hazardous air pollutants (HAPs) included
- ⌘ Also included diesel particulate matter (not a HAP)
- ⌘ All source categories they could think of (and had emission factors for)

33 Air Toxics Included in the Assessment

- ⌘ Acetaldehyde
- ⌘ Acrolein
- ⌘ Acrylonitrile
- ⌘ Arsenic compounds
- ⌘ Benzene
- ⌘ Beryllium compounds
- ⌘ 1,3-Butadiene
- ⌘ Cadmium compounds
- ⌘ Carbon tetrachloride
- ⌘ Chloroform
- ⌘ Chromium compounds
- ⌘ Coke oven emissions
- ⌘ 1,3-Dichloropropene
- ⌘ Ethylene dibromide
- ⌘ Ethylene dichloride
- ⌘ Ethylene oxide
- ⌘ Formaldehyde
- ⌘ Hexachlorobenzene
- ⌘ Hydrazine
- ⌘ Lead compounds
- ⌘ Manganese compounds
- ⌘ Mercury compounds
- ⌘ Methylene chloride
- ⌘ Nickel compounds
- ⌘ Polychlorinated biphenyls (PCBs)
- ⌘ Polycyclic organic matter (POM)
- ⌘ Propylene dichloride
- ⌘ Quinoline
- ⌘ 1,1,2,2-Tetrachloroethane
- ⌘ Tetrachloroethylene (Perchloroethylene)
- ⌘ Trichloroethylene
- ⌘ Vinyl chloride
- ⌘ Diesel particulate matter

NATA



⌘ Strengths

- ☑ New results every 3 years (1999 is coming soon)
- ☑ Census tract level results

⌘ Weaknesses

- ☑ Predicted, not observed
- ☑ Diesel emission estimates are unreliable (especially off-road vehicles)

Exposure Estimates: HAPEM

⌘ Predicts the "apparent" inhalation exposure for specified population groups

⌘ Using:

☑ census data

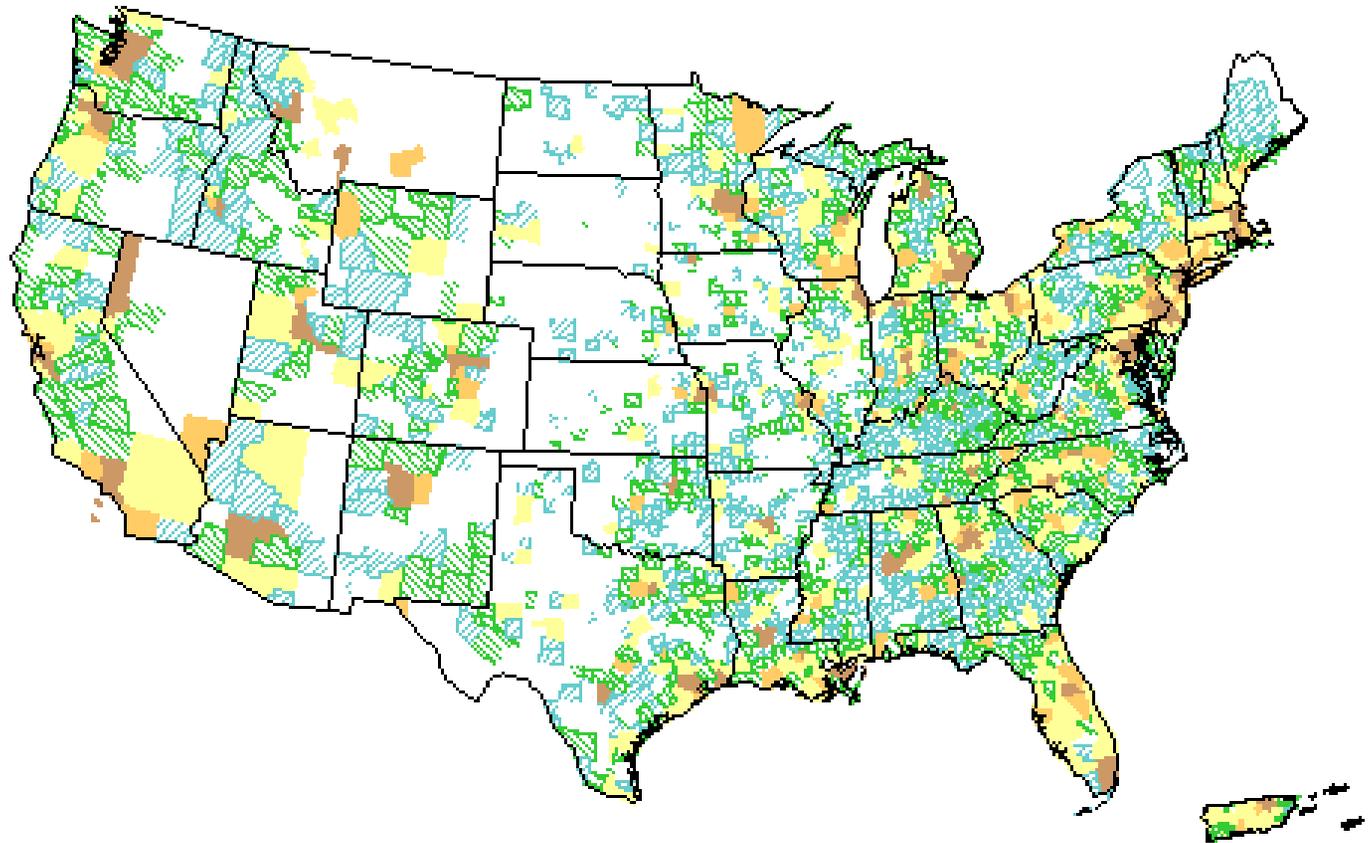
☑ human activity patterns

☑ ambient air quality levels

☑ climate data

☑ indoor/outdoor concentration relationships

1996 Estimated County Median Ambient Concentrations Benzene – United States Counties

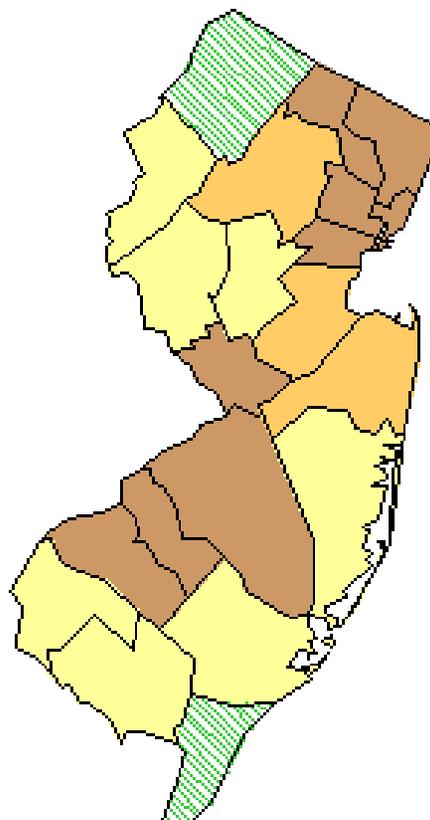


Distribution of U.S. Ambient Concentrations

Percentile	Color/Pattern	County Median Ambient Pollutant Concentration (micrograms / cubic meter)
Highest in U.S.	Dark Brown	4.75
95	Orange	1.43
90	Yellow	1.14
75	Light Green with diagonal lines	0.81
50	Light Blue with diagonal lines	0.65
25	White	0.57
Lowest in U.S.	White	0.48

Source: U.S. EPA / OAQPS
NATA National-Scale Air Toxics Assessment

1996 Estimated County Median Ambient Concentrations Benzene – NEW JERSEY Counties

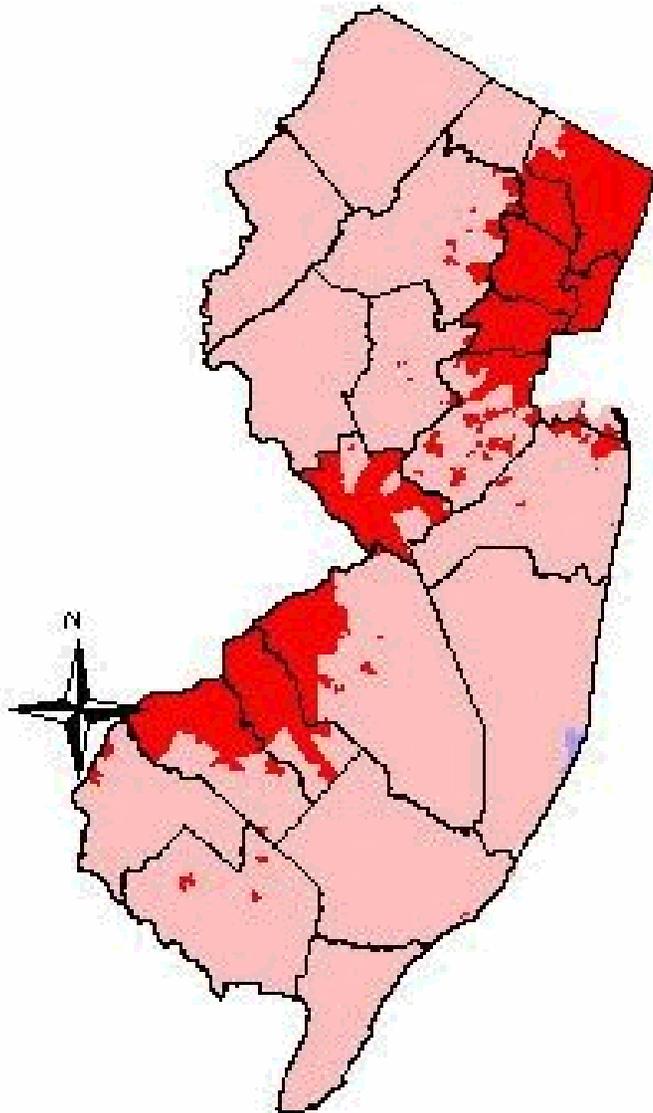


Distribution of U.S. Ambient Concentrations

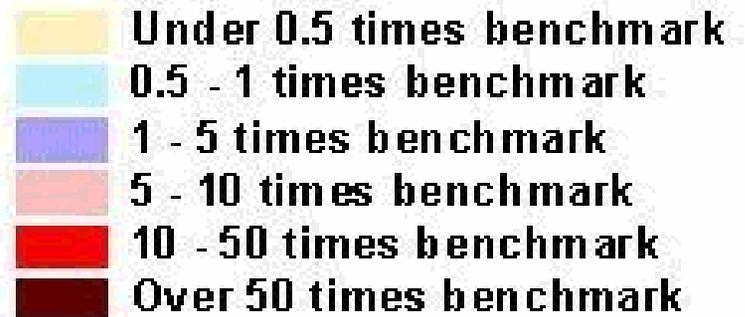
Percentile	Color/Pattern	County Median Ambient Pollutant Concentration (micrograms / cubic meter)
Highest in U.S.	Dark Brown	4.75
95	Orange	1.43
90	Yellow	1.14
75	Light Yellow	0.81
50	Green Hatched	0.65
25	Light Blue Hatched	0.57
Lowest in U.S.	White	0.48

Source: U.S. EPA / OAQPS
NATA National-Scale Air Toxics Assessment

NATA PREDICTED CONCENTRATIONS IN NEW JERSEY FOR 1996



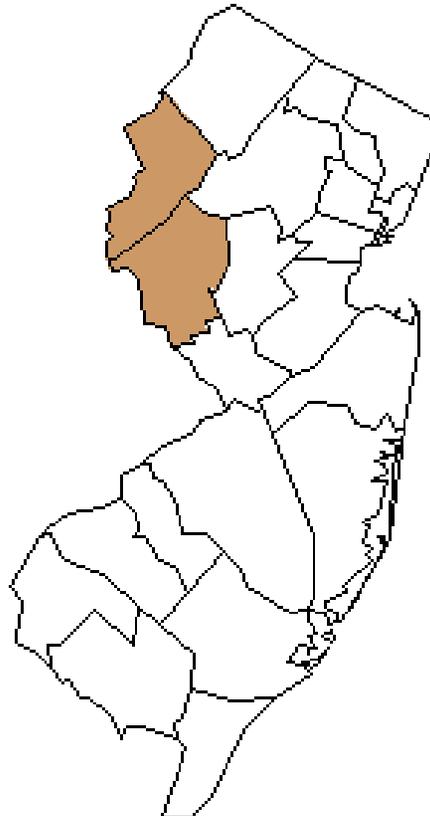
Benzene



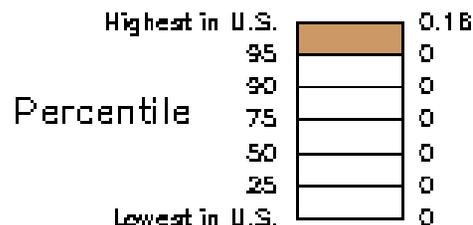
Maximum concentration is 4.5 micrograms per cubic meter, or 35 times the health benchmark

Health Benchmark = 0.13ug/m³

1996 Estimated County Median Ambient Concentrations Coke Oven Emissions – NEW JERSEY Counties



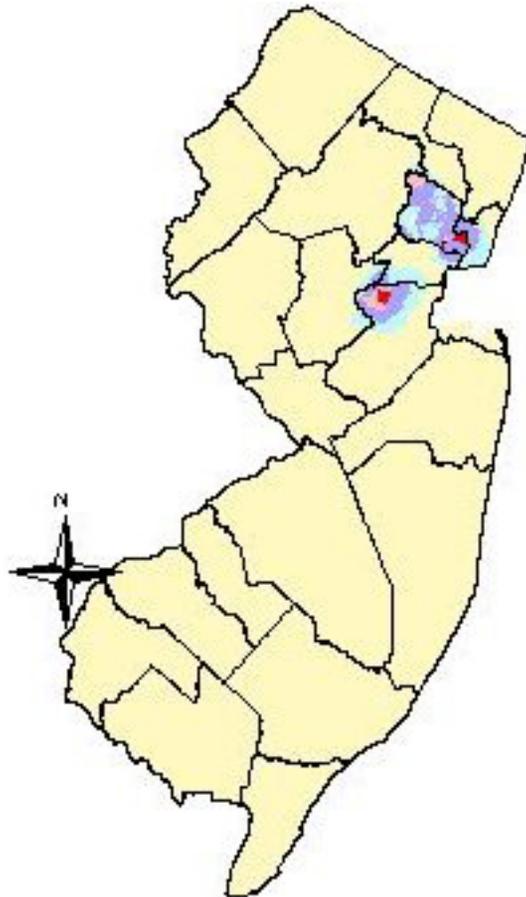
Distribution of U.S. Ambient Concentrations



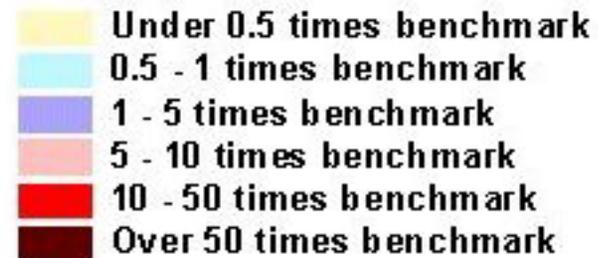
County Median Ambient Pollutant Concentration
(micrograms / cubic meter)

Source: U.S. EPA / OAQPS
NATA National-Scale Air Toxics Assessment

NATA PREDICTED CONCENTRATIONS IN NEW JERSEY FOR 1996



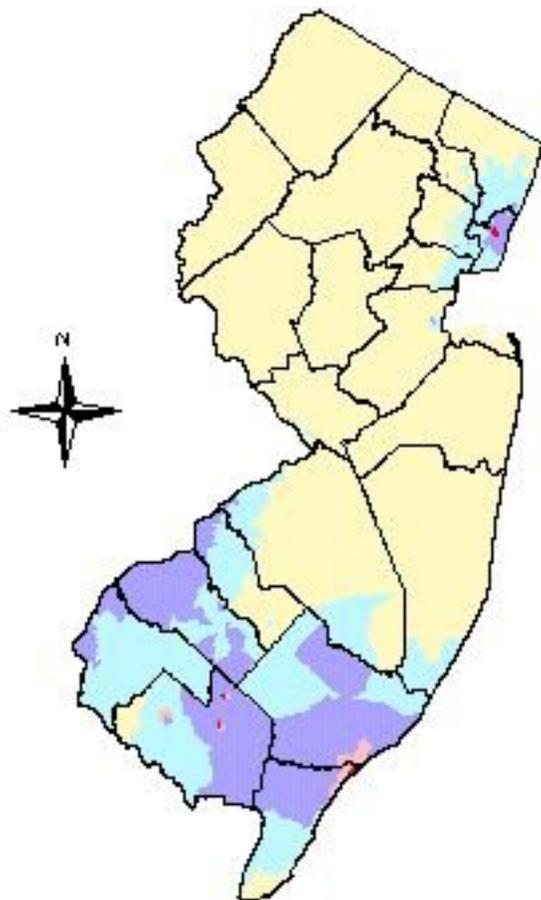
Hydrazine



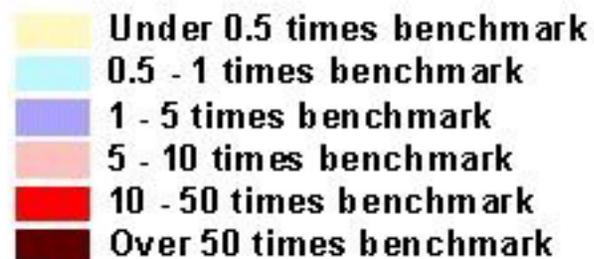
Maximum concentration is 0.01
micrograms per cubic meter, or 57
times the health benchmark

Health Benchmark = $0.0002 \mu\text{g}/\text{m}^3$

NATA PREDICTED CONCENTRATIONS IN NEW JERSEY FOR 1996



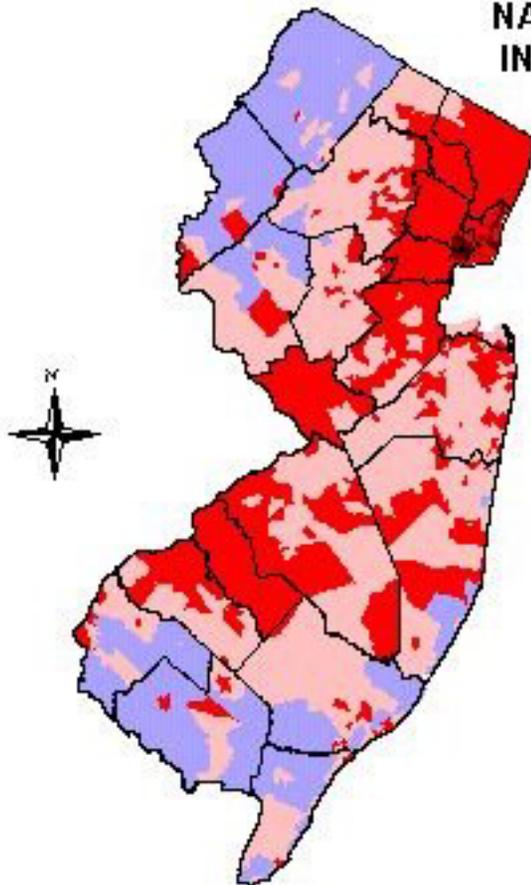
Arsenic



Maximum concentration is 0.007
micrograms per cubic meter, or 32
times the health benchmark

Health Benchmark = 0.00023ug/m³

NATA PREDICTED CONCENTRATIONS IN NEW JERSEY FOR 1996



1,3-Butadiene

- Under 0.5 times benchmark
- 0.5 - 1 times benchmark
- 1 - 5 times benchmark
- 5 - 10 times benchmark
- 10 - 50 times benchmark
- Over 50 times benchmark

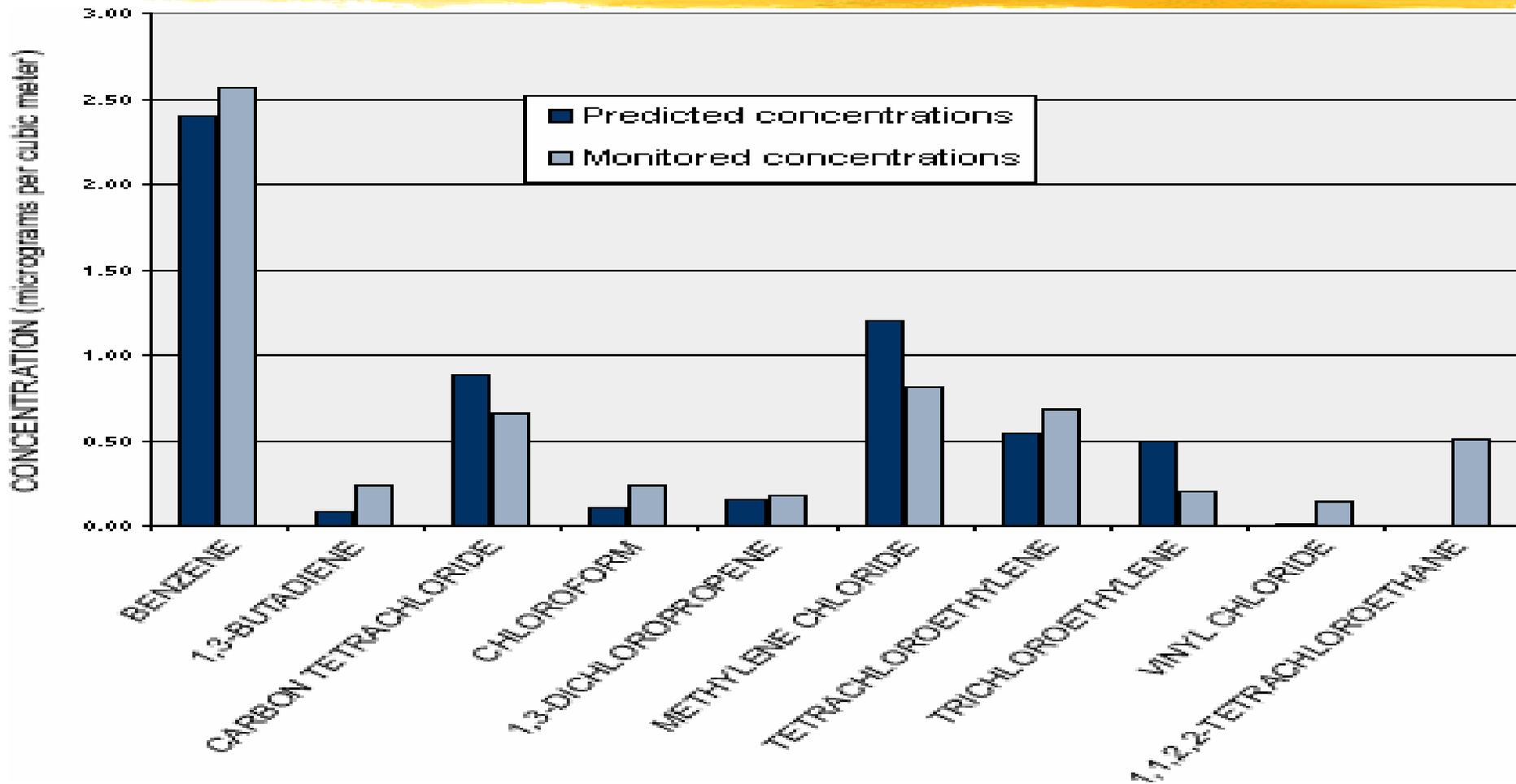
Maximum concentration is 0.49
micrograms per cubic meter, or 135
times the health benchmark

Health Benchmark = 0.0036 $\mu\text{g}/\text{m}^3$

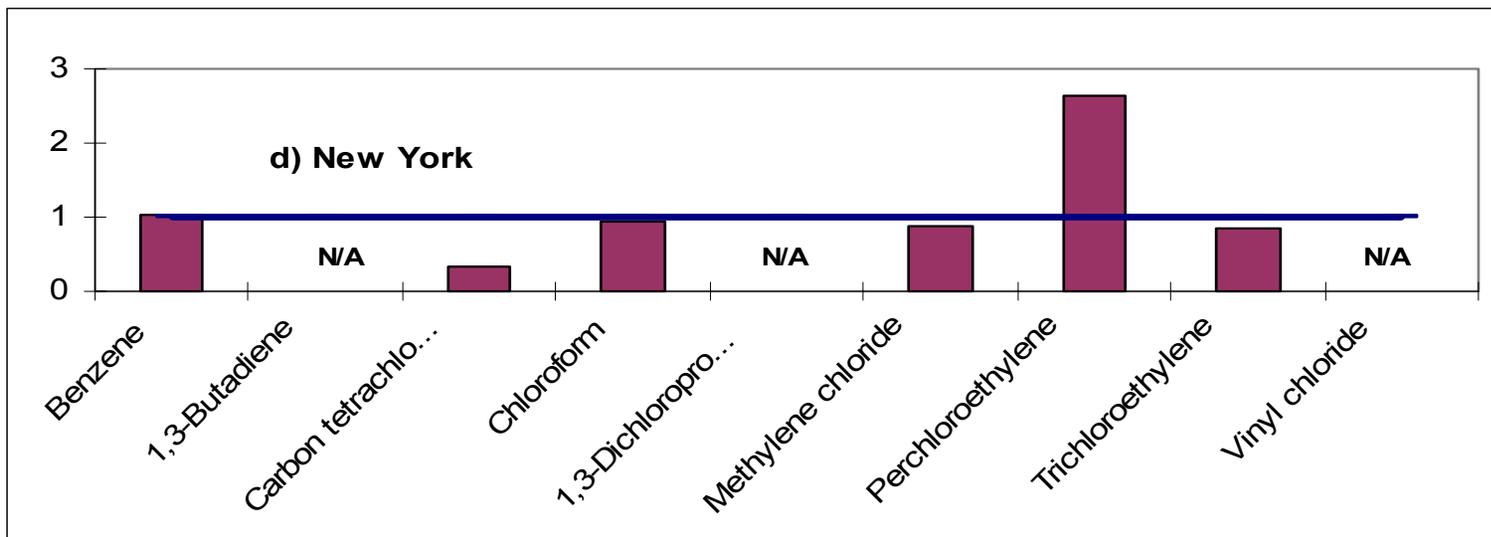
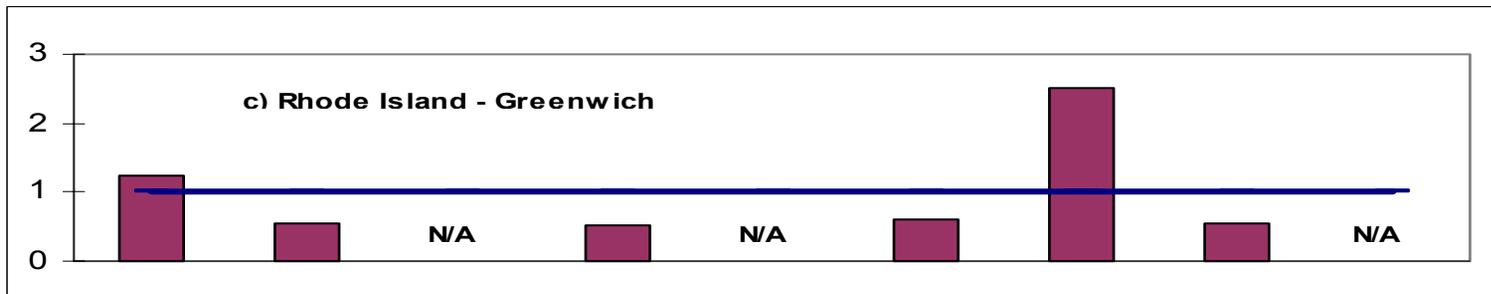
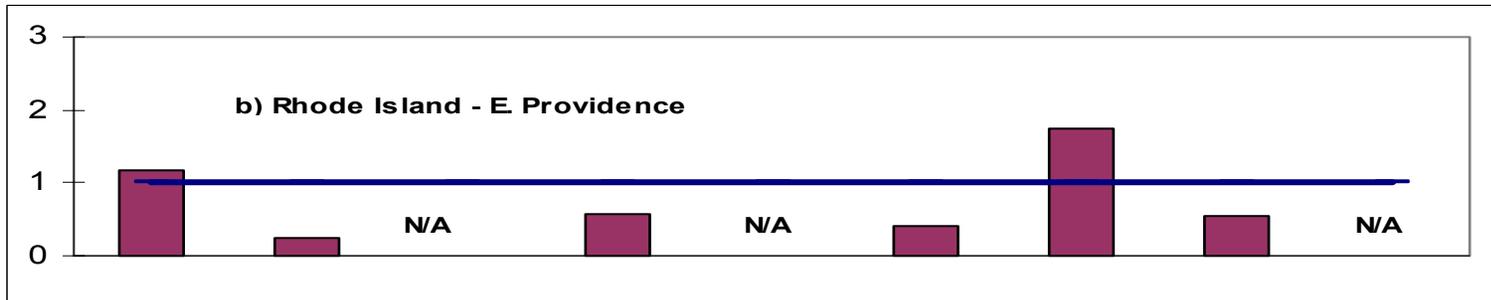


**How do NATA predicted
concentrations compare to
Monitored concentrations?**

Air Toxics Levels Measured in 1996 at Camden, New Jersey Compared to NATA Predicted Levels



Comparison of NATA1996 Predictions to Ambient Air Monitoring Data in Rhode Island & New York



Using NATA Results



- ⌘ Linkage of Asthma Morbidity and Hazardous Air Pollutants in New Jersey (NJ Dept of Health & Senior Services)
- ⌘ Low Birthweight and Exposure to Polycyclic Aromatic Hydrocarbons in New Jersey (Klotz, et al.)